Biogen Inc BIIB (NAS) | ★★★★★

Last Price	Fair Value	Consider Buy	Consider Sell	Uncertainty	Economic Moat™	Moat Trend™	Stewardship	Industry Group
273.27 USD	400.00 USD	280.00 USD	540.00 USD	Medium	Wide	Stable	Standard	Biotechnology

Biogen's multiple sclerosis market dominance and expansive neurology pipeline support its wide moat.

Updated Forecasts and Estimates from 01 Feb 2016

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The primary analyst covering this company does not own its stock.

Research as of 01 Feb 2016
Estimates as of 01 Feb 2016
Pricing data through 04 Feb 2016
Rating updated as of 04 Feb 2016

Currency amounts expressed with "$" are in U.S. dollars (USD) unless otherwise denoted.

Contents

Investment Thesis 30 Nov 2015

Biogen enjoys growing profitability from several multiple sclerosis products and cancer drug Rituxan. We think Biogen's specialty-market-focused drug portfolio and pipeline create a wide economic moat, and Tecfidera increases the firm's dominance in MS.

Biogen's strategy has its roots in the 2003 merger of Biogen (Avonex) and Idec (Rituxan). Rituxan's market penetration is already high, and patents in the United States (where Biogen derives its profit share from Roche) expire in 2018. However, we think a subcutaneous Rituxan as well as novel antibody Gazyva will allow for extended oncology revenue growth. Avonex generates $3 billion in annual sales and remains the leading MS interferon therapy. Biogen acquired full rights to MS antibody Tysabri from partner Elan, and sales reached almost $2 billion in 2014. A diagnostic test can isolate patients with the lowest progressive multifocal leukoencephalopathy risk, offering superior efficacy for the 50% of patients who have not been exposed to the JC virus.

Based on a strong launch and solid safety and efficacy data, we expect oral MS drug Tecfidera to see peak sales north of $4 billion. Two recent cases of PML and European pricing pressure have weighed on Tecfidera's growth. However, we think Tecfidera's pricing power will remain strong in the U.S., while older products like Avonex could see pricing power erode now that generic Copaxone has launched. We're less enthusiastic about sales potential for a long-acting version of Avonex (Plegridy), approved in 2014, and high-efficacy product Zinbryta (which has significant side effects, but could reach the market in 2017).

Outside of MS, we see more uncertainty, but potential to offset MS pressure. Eloctate and Alprolix in hemophilia A and B launched in 2014; the $6 billion hemophilia A market looks lucrative, but we expect entrenched competitors like Baxalta's Advate to limit potential. However, the spinal muscular atrophy program with Isis looks likely to reach $1 billion in peak sales. Biogen's LINGO program (reversal of disability in MS) and Aducanumab (Alzheimer's) could both see multibillion-dollar peak sales, but risk of failure is high.

Vital Statistics

Market Cap (USD Mil)	59,757
52-Week High (USD)	480.18
52-Week Low (USD)	254.00
52-Week Total Return %	-30.1
YTD Total Return %	-10.8
Last Fiscal Year End	31 Dec 2015
5-Yr Forward Revenue CAGR %	4.6
5-Yr Forward EPS CAGR %	8.1
Price/Fair Value	0.68

Valuation Summary and Forecasts

Fiscal Year:	2014	2015	*2016(E)*	*2017(E)*
Price/Earnings	24.5	18.0	*14.6*	*13.5*
EV/EBITDA	14.4	13.7	*10.6*	*10.1*
EV/EBIT	16.9	15.6	*11.7*	*11.0*
Free Cash Flow Yield %	4.0	4.4	*6.0*	*6.4*
Dividend Yield %	—	—	—	—

Financial Summary and Forecasts (USD Mil)

Fiscal Year:	2014	2015	*2016(E)*	*2017(E)*
Revenue	9,704	10,765	*11,233*	*11,745*
Revenue YoY %	40.0	10.9	*4.4*	*4.6*
EBIT	3,917	5,016	*5,379*	*5,692*
EBIT YoY %	57.3	28.1	*7.2*	*5.8*
Net Income, Adjusted	3,282	3,936	*4,087*	*4,306*
Net Income YoY %	53.6	19.9	*3.8*	*5.4*
Diluted EPS	13.84	17.02	*18.66*	*20.21*
Diluted EPS YoY %	54.3	23.0	*9.6*	*8.3*
Free Cash Flow	1,273	3,142	*2,431*	*2,641*
Free Cash Flow YoY %	104.0	146.9	*-22.6*	*8.6*

Historical/forecast data sources are Morningstar Estimates and may reflect adjustments.

Profile

Biogen and Idec merged in 2003, combining forces to market Biogen's multiple sclerosis drug Avonex and Idec's leading cancer drug Rituxan. Today, Rituxan and next-generation antibody Gazyva are marketed via a collaboration with Roche. Biogen markets novel MS drugs Tysabri and Tecfidera independently, and newly approved hemophilia therapies Eloctate and Alprolix with partner SOBI. Biogen has several drug candidates in phase 3 trials in the fields of immunology and neurology.

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Morningstar Analysis

Valuation, Growth and Profitability 01 Feb 2016

Our fair value estimate for Biogen stands at $400 per share, as slightly lower assumptions for Gazyva and Lingo are countered by higher estimates for ocrelizumab.

We think global Tecfidera sales will peak at $4.4 billion in 2018 before the entry of new oral competition. Beyond Tecfidera, we think combined global sales of Avonex and Plegridy will continue to fall in 2016, with mid- to high-single-digit declines annually because of new competition. We expect Tysabri to decline from $1.9 billion in 2016 to $1.1 billion by the end of our 10-year forecast, as JCV-positive patients switch to other effective therapies like ocrelizumab. We include higher sales for ocrelizumab, with a 90% probability of sales hitting $5 billion by 2023 (we assume Biogen sees roughly 13% of global sales). Optic neuritis data for the anti-Lingo program in January 2015 was mixed, and we assume a 30% probability of sales for the drug in MS surpassing $6 billion by year 10 of our forecast.

Outside of MS, we assume Biogen's profit share on Rituxan and Gazyva slides from $1.3 billion in 2016 to $700 million in 10 years, as oral competition in blood cancer intensifies. We think Biogen could recognize $500 million in sales at peak for Alprolix in hemophilia B and $500 million at peak for Eloctate in hemophilia A. For ISIS-SMNRx, we include $1.5 billion in sales by 2025 using a 65% probability of approval ($2.8 billion in potential sales). After positive phase 1 data for Alzheimer's drug Aducanumab in December 2014, Biogen's decision to move the product to phase 3, and the collaboration with Eisai on BAN2401 and E2609, we now include more than $3 billion in probability-weighted Alzheimer's sales to Biogen by 2025 (implying total sales exceeding $15 billion if all products are approved). We include $1 billion in 2025 sales for all biosimilar and gene therapy products, combined.

We see non-GAAP operating margins growing from 50% in 2014 to 52.5% in 2020, as the launch of Tecfidera has boosted operating leverage. Overall, we think Biogen's top-line growth will average 5% during the next five years, and share-repurchase activity as well as operating leverage should enable the firm to achieve average earnings per share growth of 8% during this same period.

We still rate the systematic risk surrounding Biogen shares as below average, and we use a 7.5% cost-of-equity assumption to align our capital cost assumptions with the returns equity investors are likely to demand over the long run.

Scenario Analysis

We assign Biogen Idec a medium uncertainty rating, as demand is relatively inelastic for Biogen's portfolio of MS treatments, but revenue remains focused on one therapeutic area and increasingly on one product (Tecfidera). In our base-case scenario, we expect Tecfidera's peak sales to surpass $4 billion, as the drug's safety and efficacy profile still look strong despite two recent cases of PML. We also assume that Tysabri sales peak at $1.9 billion in 2016, as we think new patient adds (from patients testing seronegative for the JC virus antibody) and U.S. pricing power may not be able to counter the impact of discontinuations from seropositive patients or new alternative regimens (ocrelizumab) in the long run. Overall, this scenario assumes Biogen's global patient share in MS grows from 40% in 2015 to 53% in 2020, including ocrelizumab patients. In this scenario, we think operating margins will expand to 53% during the next five years, thanks to operating leverage from manufacturing and selling costs.

In our bull-case scenario--valuing Biogen at $493 per share--Tysabri sales stay flat around $1.9 billion annually during our 10-year explicit forecast period. We also assume that Tecfidera becomes the dominant player in the MS market despite a high price tag and recent safety concerns,

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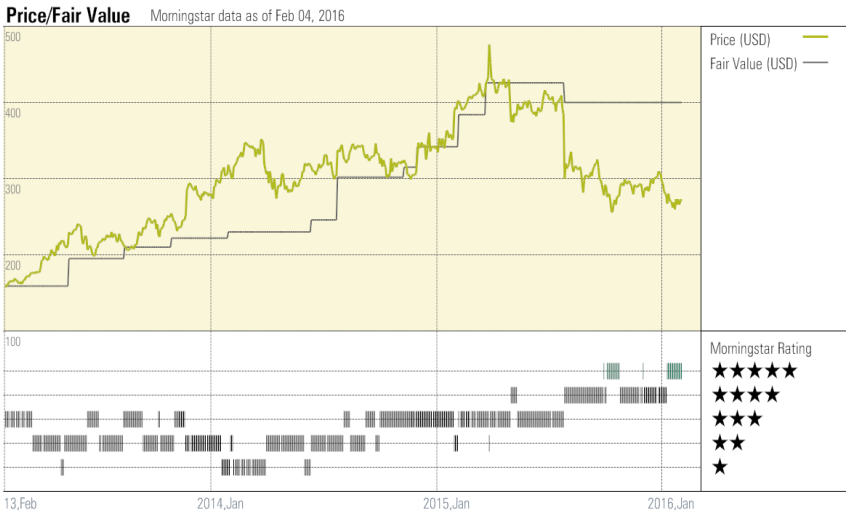

allowing it to secure nearly $5 billion in annual sales in 2024 as 2028 patents are upheld and oral competition remains limited. This translates to an overall global MS patient share of 57% in 2020. In our bear-case scenario, we value Biogen at $296 per share. We assume heavy discontinuations and new competitive threats weigh on Tysabri sales, with global Tysabri sales declining to $900 million by 2025. We also forecast peak Tecfidera sales under $4 billion in 2017 in our bear-case scenario, which factors in strong competition from novel oral drugs from XenoPort and Alkermes, generic Tecfidera competition after early patents expire, and slower uptake of Tecfidera following the approval of cheaper generic versions of Copaxone (Glatopa was launched in mid-2015). This scenario results in Biogen's global MS patient share of 49% by 2020.

Economic Moat

Biogen has achieved strong profitability on the success of three marketed products in the fields of oncology and neuroimmunology, and the introduction of Tecfidera secures the firm's dominant share of the MS market. We think barriers to entry for potential biosimilars to Biogen's products are high, and Biogen has a strong R&D strategy for maintaining its leadership in MS, where pricing power is strong, patient need for novel therapies is high, and the pipeline has been particularly productive. These factors contribute to the firm's wide moat. Returns on invested capital, which we think will average above 20% during our 10-year explicit forecast period, easily exceed our 7.5% estimate of Biogen's cost of capital.

Rituxan remains the standard of care in several forms of hematological cancer, and Biogen's margins are boosted by collaboration revenue received from partner Roche. Biogen's Avonex is the leading interferon therapy in MS, due to its long-term safety record and relatively convenient once-weekly injections. Biogen's third drug, MS drug Tysabri, is achieving blockbuster sales based on outstanding efficacy despite rare but serious side effects, and we think efforts to target the drug to patients least likely to experience side effects will allow the firm to retain current sales levels despite novel products with cleaner safety profiles. The rest of Biogen's MS pipeline is also strong; we expect newly launched Tecfidera to achieve peak sales approaching $5 billion globally, based on its convenient oral administration and relatively strong efficacy and safety profile.

With the exception of Tecfidera, all of Biogen's current blockbusters are biologics, and while biosimilar competition is a looming threat, we think any erosion of sales of these products would be slowed by the significant manufacturing and development costs that biosimilar makers are expected to incur, limiting the number of competitors and their ability to compete on price. Data quality may also be an issue with biosimilars; the first application for an Avonex biosimilar was rejected based on insufficient efficacy, and delays and discontinuations with Rituxan biosimilars have pushed back their potential launch dates in Europe. Tysabri is likely to be a lower-priority target for biosimilar entrants, given the risk monitoring and potentially serious side effects in certain patients.

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Moat Trend

We see Biogen's moat trend as stable, as we think new competition for established drugs should be offset by the introduction of new products from the firm's growing late-stage pipeline.

Competition and pricing pressure in MS and oncology are increasing. We think strong efficacy of oral MS therapies (Biogen's Tecfidera and Novartis' Gilenya) and injectable therapies (Roche is poised to launch ocrelizumab in late 2016) is making it less likely that new patients will start on older injectables like Avonex or Tysabri. In addition, payers have more leverage in pricing negotiations, and while we assume that Biogen has been able to take Avonex price increases of roughly 10% annually on a net basis over the past several years in the U.S., we think future price changes in the U.S. are likely to be flat to negative. Biogen's recently launched, more convenient interferon therapy Plegridy should do little to change this trend, in our opinion, and we don't model growth for combined Avonex/Plegridy or for Tysabri going forward. In addition, Biogen's reported revenue for cancer therapy Rituxan is maturing as its patent expiration in the U.S. (2018) draws closer.

However, we think Biogen's pipeline will allow the firm to maintain MS and oncology sales. Roche plans to file for approval of novel and effective antibody therapy ocrelizumab in 2016, in both relapsing MS (where Biogen competes) and primary progressive MS (where there are no approved treatments and little off-label use of Biogen's current drugs). While we noted that this adds to the competitive landscape, it also benefits Biogen, due to the roughly 20% royalty on U.S. sales (the U.S. is two thirds of the global $20 billion MS market) and exposure to the new PPMS indication. Biogen's anti-LINGO drug candidate (generating phase 2 data in mid-2016) is a key part of its MS pipeline; the drug could help repair the myelin sheath that coats neurons, giving it a novel mechanism of action and the potential to allow patients to regain lost function. In oncology, we expect Biogen and partner Roche to extend oncology profit streams through subcutaneous Rituxan and also next-generation drug Gazyva, which has launched in leukemia as a product with a superior efficacy profile to Rituxan, and is beginning to generate strong data in the large lymphoma market.

While individual odds of approval are mixed, we're bullish on Biogen's novel, broader neurology and rare disease pipeline, which includes several products with high risk but high reward prospects. The firm recently launched two long-acting hemophilia drugs, Eloctate and Alprolix, marking the firm's entry into this rare-disease market. Spinal muscular atrophy drug nusinersen should have phase 3 data in 2017, and the lack of treatment options for this rare, deadly disease could create a $1 billion-plus market. Biogen has the broadest exposure to Alzheimer's of the large drug firms, with two lead beta-amyloid antibodies (from Eisai and Neurimmune), and a BACE inhibitor (Eisai). The initial data for aducanumab—now in phase 3 trials—was impressive enough that it could be clinically significant if replicated in phase 3, and we think ARIA-E (edema) side effects will be manageable. We assign a 50% probability of approval to aducanumab, with probability-weighted sales of more than $3 billion by 2024. Overall, we think Biogen's Alzheimer's drugs could see $6 billion in sales by 2024, with Biogen recognizing half of these economics.

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Bulls Say/Bears Say

Bulls Say

- Biogen leads the $20 billion global MS market with Avonex and Tysabri, and the launch of Tecfidera secures the firm's dominance for at least the next several years.
- Despite two recent cases of PML, Tecfidera's safety and efficacy profile and its oral administration make it a strong option for first-line MS patients, allowing for more than $4 billion peak sales potential.
- Biogen's broader neurology pipeline, including LINGO and Alzheimer's drugs, should help diversify revenue and further boost sales growth sparked by Tecfidera.

Bears Say

- Avonex has lost its edge as the leading MS drug. Similar competitors nip at its heels, novel oral therapies are launching, and generic Copaxone could trigger more discounting.
- Tysabri's efficacy could be overshadowed by worrisome side effects as additional cases of PML are reported in Tysabri users and as patients who test positive for the JC virus antibody discontinue therapy.
- XenoPort, Alkermes, and Forward Pharma are developing drugs that are similar to Tecfidera but may be able to bypass Tecfidera's patents, and their entry could shorten Tecfidera's growth trajectory.

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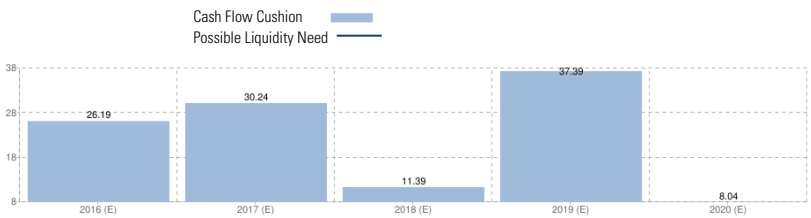
Five Year Adjusted Cash Flow Forecast (USD Mil)

	2016(E)	2017(E)	2018(E)	2019(E)	2020(E)
Cash and Equivalents (beginning of period)	6,200	7,431	7,711	8,085	9,953
Adjusted Available Cash Flow	2,651	2,869	2,827	4,637	5,029
Total Cash Available before Debt Service	8,851	10,300	10,539	12,722	14,982
Principal Payments	—	—	-550	—	-1,500
Interest Payments	-279	-279	-313	-275	-363
Other Cash Obligations and Commitments	-59	-61	-62	-65	—
Total Cash Obligations and Commitments	-338	-341	-925	-340	-1,863

Cumulative Annual Cash Flow Cushion



Adjusted Cash Flow Summary

	USD Millions	% of Commitments
Beginning Cash Balance	6,200	162.9
Sum of 5-Year Adjusted Free Cash Flow	18,013	473.1
Sum of Cash and 5-Year Cash Generation	24,213	636.0
Revolver Availability	—	—
Asset Adjusted Borrowings (Repayment)	—	—
Sum of Cash, 5-Year Cash Generation, Revolver and Adjustments	24,213	636.0
Sum of 5-Year Cash Commitments	-3,807	—

Financial Health

Biogen's financial health has weakened from its recent cash-rich existence. At the end of June, the firm held $4.5 billion in cash and investments on its balance sheet relative to less than $600 million in debt obligations, mostly due in 2018. However, on Sept. 10, Biogen issued a multitranche debt offering of $6 billion, split among new 5-year ($1.5 billion,) 7-year ($1.0 billion), 10-year ($1.75 billion), and 30-year ($1.75 billion) issues. The proceeds from this issuance will help fund its $5 billion share-repurchase program among other general corporate purposes. This new issuance has weakened its credit profile, in our opinion, but with gross debt/EBITDA only rising about a turn to the low 1s, we still think the firm's balance sheet remains easily manageable.

Enterprise Risk

Biogen Idec's profitability depends on four key blockbusters and a high-risk, but potentially high-reward, pipeline. If future Gazyva data do not support superiority over Rituxan in key hematological oncology indications like NHL, revenue from the Roche collaboration (which feeds directly to the bottom line and boosts margins) could begin to decline as biosimilars enter the U.S. market as early as 2018. Tecfidera's U.S. launch is beginning to see slower growth, partly due to concerns about two recent cases of PML. Avonex and Tysabri sales are still being adversely affected, as patients are switching from one Biogen product to another. Biogen delayed its Tecfidera launch in Europe as it awaited a decision on regulatory exclusivity; while Biogen received 10-year protection in late 2013, similar oral drugs from XenoPort, Alkermes, and Forward Pharma could still compete with Tecfidera globally by the end of the decade. In the meantime, pricing pressure in Europe has been more severe than Biogen anticipated. While Plegridy is likely to help Biogen maintain its lead in the interferon market, we expect generic Copaxone to weigh on sales of injectable MS therapies. Biogen's MS portfolio has enjoyed

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tremendous pricing power in the United States, and insurers could begin to find ways to put pressure on future price increases as more competitors reach the market (Avonex and Plegridy are excluded from the CVS national formulary for 2016).

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Management & Ownership

Management Activity

Name	Position	Shares Held	Report Date*	InsiderActivity
DR. GEORGE A. SCANGOS,PHD	Director	41,090	01 Jun 2015	—
MR. JOHN G. COX		25,567	25 Mar 2015	—
MR. PAUL J. CLANCY		22,257	12 Feb 2015	—
DR. STELIOS PAPADOPOULOS,PHD	Director	16,580	27 Jul 2015	—
MS. CAROLINE D. DORSA	Director	16,033	10 Jun 2015	—
ROBERT W. PANGIA	Director	15,568	10 Jun 2015	—
DR. ERIC K. ROWINSKY,M.D.	Director	12,005	10 Jun 2015	—

*Represents the date on which the owner's name, position, and common shares held were reported by the holder or issuer.

Fund Ownership

Top Owners	% of Shares Held	% of Fund Assets	Change (k)	Portfolio Date
Vanguard PrimeCap Fund	4.02	6.47	—	30 Sep 2015
Fidelity® Contrafund® Fund	2.23	1.28	-371	30 Nov 2015
Vanguard Total Stock Mkt Idx	1.83	0.31	-148	31 Dec 2015
Vanguard Health Care Fund	1.56	2.21	1,886	30 Sep 2015
ClearBridge Aggressive Growth Fund	1.47	7.45	—	31 Dec 2015
Concentrated Holders				
Biotech Growth Trust Plc	0.12	11.41	12	31 Oct 2015
OMI IM GBP AXA Framlington Biotech	0.14	10.27	57	30 Sep 2015
UBS (Lux) EF Biotech (USD)	0.19	9.68	56	30 Sep 2015
CP Global BioPharma	—	9.23	—	30 Jun 2015
Arc Actions Biotech	—	9.19	0	30 Jun 2015

Institutional Transactions

Top 5 Buyers	% of Shares Held	% of Fund Assets	Shares Bought/ Sold (k)	Portfolio Date
Geode Capital Management, LLC	0.83	0.41	1,952	30 Sep 2015
Janus Capital Management LLC	1.67	0.77	1,747	30 Sep 2015
Steadfast Capital Management LLC	0.41	5.36	953	30 Sep 2015
Columbia Mangmt Investment Advisers, LLC	1.47	0.75	894	30 Sep 2015
Wellington Management Company LLP	2.41	0.46	829	30 Sep 2015
Top 5 Sellers				
Fidelity Management and Research Company	7.00	0.73	-5,117	30 Sep 2015
T. Rowe Price Associates, Inc.	2.56	0.39	-4,447	30 Sep 2015
Wells Capital Management Inc.	0.21	0.28	-916	30 Sep 2015
J.P. Morgan Investment Management Inc	1.11	0.36	-823	30 Sep 2015
Jennison Associates LLC	1.73	1.20	-786	30 Sep 2015

Management 30 Dec 2015

We award Biogen a Standard Stewardship Rating. James C. Mullen, who worked his way up to CEO and chairman of Biogen before the merger, served as Biogen Idec's CEO and president until his retirement in June 2010. George Scangos took over as CEO in July 2010, after serving as CEO of development-stage biotech Exelixis for 14 years. While we see this as an unconventional choice given his recent experience at a firm without commercial operations, we think his performance at Exelixis demonstrates a strong understanding of business development strategies and pipeline prioritization. In addition, his unit at Bayer marketed a hemophilia product that Biogen now competes with. Two key hires to management also appear to have served Biogen well; Doug Williams has acted as head of research and development (previously head of research at Immunex and CEO of ZymoGenetics) and Steve Holtzman is head of corporate development (previously at Millennium and Infinity). While Doug Williams left to pursue a startup biotechnology opportunity in August 2015, Biogen Chief Medical Officer Alfred Sandrock and Chief Scientific Officer Spyros Artavanis-Tsakonas have decades of experience to support Biogen's pipeline.

Longtime director William Young has stepped down from his role as independent chairman, replaced by Stelios Papadopoulos (chairman at Exelixis and Regulus) at Biogen's annual meeting in May 2014. Overall, we see the board as well qualified, diverse, and independent, despite the long tenures of several directors. We applaud Biogen's efforts to emphasize restricted stock and options in compensation packages for top executives, which we believe aligns their interests with shareholders'. However, takeover defenses, such as authorized preferred stock, may work against the interests of shareholders. Complex rights agreements between Biogen and partner Roche are also triggered if Biogen is acquired, which could dampen the enthusiasm of potential acquisitors.

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Analyst Notes

Biogen's Tecfidera Strength Boosts Q4 Results: Maintaining FVE Ahead of Key 2016 Pipeline Data 27 Jan 2016

Biogen reported fourth-quarter results that were ahead of our expectations on the top and bottom line, largely owing to Tecfidera's strong 8% global growth in the fourth quarter. However, our forecast of $11.3 billion in revenue and $18.40 non-GAAP EPS for 2016 is in line with the firm's guidance ($11.1 billion-$11.3 billion and $18.30-$18.60, respectively), and we're making no significant changes to our $400 fair value estimate. Shares of this wide-moat biotech remain significantly undervalued, and the firm's dominance in the field of MS and innovative research and development strategy in neurology provide it with long-term competitive advantages.

Biogen's performance in 2015 hinged on Tecfidera, and we think U.S. stabilization and European growth put Tecfidera on track to achieve our estimates. 2016 guidance still implies high-single-digit U.S. Tecfidera growth and low-double-digit international Tecfidera growth, driven largely by demand. While Biogen did take a list price increase of roughly 4% at the end of 2015, not all of this translates to a net price increase, and Biogen does not anticipate further price increases for the remainder of the year.

Beyond Tecfidera, we expect Biogen shares will be driven by business development and data readouts in 2016. Biogen has completed its $5 billion share-buyback program, and we think the firm wants to remain flexible with its $6.2 billion cash balance, given the biotech pullback and the potential for better partnering or acquisition terms. Biogen's LINGO program in MS will have Phase II data in mid-2016 that we expect to significantly boost the stock, if positive—we currently assume a 30% probability of approval, given the mixed data in optic neuritis and the novelty of the target. Several data readouts in Alzheimer's will affect Biogen as well, and we think titration data from the Phase I PRIME study of Biogen's leading Alzheimer's drug candidate aducanumab (second-half 2016) could alleviate side-effect concerns.

As we discussed in our December Healthcare Observer, "Wide-Moat Firms in Alzheimer's Disease," we think the market is undervaluing Biogen's opportunity in this market, putting short-term Tecfidera uncertainty ahead of the long-term neurology promise of its pipeline. Data from the Eisai collaboration in Alzheimer's—safety data for BACE inhibitor E2609 and safety and efficacy for beta amyloid antibody BAN2401—could come later this quarter. While we still assign relatively low probabilities of approval to these compounds, positive data for either program would likely boost our estimates. Finally, we think the market ties the prospects of Biogen's Alzheimer's program together with those of Lilly's phase 3 solanezumab program, which should have data by the end of the year. However, because aducanumab and solanezumab have very different mechanisms of action, we would not expect to change our Biogen valuation on this data.

Cost Cuts Balance Tysabri Failure in Our Biogen Valuation; Current Price Doesn't Value Pipeline 21 Oct 2015

Biogen's cost-cutting plans and heavy share repurchases at discounted prices counter the impact of Tysabri's failure in secondary progressive multiple sclerosis and the discontinuation of early programs in immunology and fibrosis on our valuation, and we're maintaining our $400 fair value estimate. Biogen is facing near-term weakness in its current MS franchise, with growth from Tecfidera and ocrelizumab (Biogen sees roughly 20% royalties from Roche on U.S. sales) likely to be weighed down by interferon and Tysabri declines. However, we still think the firm is capable of 6% average top-line growth and 11% average bottom-line growth over the next five years.

While threats to Biogen's older products are well-known,

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Last Price	Fair Value	Consider Buy	Consider Sell	Uncertainty	Economic Moat™	Moat Trend™	Stewardship	Industry Group
273.27 USD	400.00 USD	280.00 USD	540.00 USD	Medium	Wide	Stable	Standard	Biotechnology

Analyst Notes

we think the market doesn't assign enough value to Biogen's pipeline, and we're encouraged that management is further focusing on its competitive advantages and wide moat in neurology with the new restructuring plan. While each individual neurology program has risk, we think this strategy supports Biogen's ability to demonstrate value. The Lingo program could be among Biogen's biggest opportunities (data mid-2016 in MS), but we're most bullish on Biogen's partnership with Isis (a spinal muscular atrophy program should have data in late 2016), and the Neurimmune collaboration in Alzheimer's/Parkinson's (aducanumab is now in phase 3 trials in Alzheimer's). We think the recent deal for MT-1303 could allow Biogen to not only hedge against threats to its MS franchise, but to also expand into new indications.

We're increasing our top- and bottom-line expectations for 2015 and remain at the high end of new guidance, as we assume 9% revenue growth and non-GAAP EPS of $16.53 (new range from $16.20-$16.50, up from $15.50-$15.95). Biogen has repurchased 13 million shares of its stock in 2015, and at an average price of $300 per share, this looks like a smart use of cash. Biogen's recent $6 billion debt raise also adds cash that could be put toward acquisitions.

Diving deeper into Biogen's MS portfolio, Tecfidera has the best prospects for growth through 2019, and we think Biogen's new advertising campaigns could draw more patients to therapy. In addition, Roche's positive ocrelizumab data looks neutral to Biogen's earnings prospects, as royalties will go directly to the firm's bottom line. We think rapid uptake in primary progressive disease will have minimal impact on sales of Biogen's therapies (not approved or heavily used off-label in this indication), and uptake among relapsing MS patients—Biogen's focus—will be slower. Tysabri could be the hardest hit by Roche's ocrelizumab launch (expected in late 2016), particularly given its failure in secondary progressive MS; we currently assume slow but steady Tysabri declines as current patients remain on therapy but fewer patients initiate treatment. Interferon sales are poised to decline; combined sales of Biogen's interferon therapies Avonex and Plegridy grew 5% to $785 million in the quarter, true growth (after accounting for foreign-exchange headwinds, and stocking and order timing tailwinds), was closer to 1%.

Pricing Concerns in Pharma and Biotech Industries Creates Some Buying Opportunities 29 Sep 2015

The pharma and biotech sectors have recently faced significant market weakness, largely because of recent headlines about price-gouging, strong policy positions from presidential candidates, notably Hillary Clinton, and congressional investigations into drug pricing. Overall, this echoes a previous industry sell-off in the spring of 2014 when some members of Congress questioned the pricing of Gilead's Sovaldi. Valeant Pharmaceuticals received queries on Sept. 28 from politicians about the company's drug pricing on a handful of recently acquired products. While certain components of policy proposals span from highly unlikely (mandating research and development levels at drug developers) to possible (shortening the exclusivity period for biologics), our moat methodology, uncertainty ratings, debt ratings, and fair value estimates attempt to capture a particular company's risks to a variety of issues beyond drug pricing. Based on current information, we don't see any particular reason to adjust our fair value estimates for the drug companies we cover at this time. Lawsuits, changes to Medicare pricing, new tax rules, or other policy suggestions remain mostly speculative at this point, and in our view the pullback has created some opportunities.

Merck remains our most undervalued Big Pharma idea, because we believe the company's immuno-oncology franchise is underappreciated and the current valuation already appears to have taken into account the competitive threats to its top drug Januvia from the SGLT2 class.

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Analyst Notes

Our favorite names in biotech remain wide-moat Amgen and Biogen (both on our Best Ideas list) because of their diversified portfolios and innovative pipelines. In addition, narrow-moat Biomarin, which has sold off particularly hard, probably because of its high-priced drugs, is an attractive value since it is still well-protected from competition in the rare-disease space and has a compelling pipeline.

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273.27 USD	400.00 USD	280.00 USD	540.00 USD	Medium	Wide	Stable	Standard	Biotechnology

Morningstar Analyst Forecasts

Financial Summary and Forecasts

Fiscal Year Ends in December

Growth (% YoY)	3-Year Hist. CAGR	2013	2014	2015	Forecast 2016	Forecast 2017	5-Year Proj. CAGR
Revenue	*25.0*	25.7	40.0	10.9	*4.4*	*4.6*	*4.6*
EBIT	*39.7*	35.5	57.3	28.1	*7.2*	*5.8*	*6.0*
EBITDA	*37.3*	37.1	52.4	23.9	*3.9*	*4.9*	*4.9*
Net Income	*35.9*	36.2	53.6	19.9	*3.8*	*5.4*	*5.0*
Diluted EPS	*37.5*	37.1	54.3	23.0	*9.6*	*8.3*	*8.1*
Earnings Before Interest, after Tax	*40.4*	31.3	57.4	33.9	*4.3*	*5.0*	*5.0*
Free Cash Flow	*54.6*	-26.6	104.0	146.9	*-22.6*	*8.6*	*9.0*

Profitability	3-Year Hist. Avg	2013	2014	2015	2016	2017	5-Year Proj. Avg
Operating Margin %	*41.0*	35.9	40.4	46.6	*47.9*	*48.5*	*48.9*
EBITDA Margin %	*48.0*	43.6	47.5	53.0	*52.8*	*52.9*	*53.2*
Net Margin %	*33.7*	30.8	33.8	36.6	*36.4*	*36.7*	*36.9*
Free Cash Flow Margin %	*17.1*	9.0	13.1	29.2	*21.6*	*22.5*	*27.4*
ROIC %	*25.5*	19.9	26.0	30.7	*29.3*	*28.3*	*27.8*
Adjusted ROIC %	*22.8*	18.0	23.5	26.8	*24.5*	*22.7*	*21.8*
Return on Assets %	*20.1*	16.9	22.4	21.0	*18.0*	*17.2*	*16.6*
Return on Equity %	*29.8*	23.9	30.2	35.3	*35.2*	*30.8*	*28.8*

Leverage	3-Year Hist. Avg	2013	2014	2015	2016	2017	5-Year Proj. Avg
Debt/Capital	*0.18*	0.06	0.05	0.41	*0.35*	*0.32*	*0.30*
Total Debt/EBITDA	*0.49*	0.20	0.13	1.15	*1.11*	*1.05*	*1.04*
EBITDA/Interest Expense	—	83.72	—	—	*21.21*	*22.25*	*21.59*

Valuation Summary and Forecasts

	2014	2015	2016(E)	2017(E)
Price/Fair Value	0.99	0.77	—	—
Price/Earnings	24.5	18.0	*14.6*	*13.5*
EV/EBITDA	14.4	13.7	*10.6*	*10.1*
EV/EBIT	16.9	15.6	*11.7*	*11.0*
Free Cash Flow Yield %	4.0	4.4	*6.0*	*6.4*
Dividend Yield %	—	—	—	—

Key Valuation Drivers

Cost of Equity %	7.5
Pre-Tax Cost of Debt %	5.8
Weighted Average Cost of Capital %	7.3
Long-Run Tax Rate %	25.8
Stage II EBI Growth Rate %	3.5
Stage II Investment Rate %	20.0
Perpetuity Year	20

Additional estimates and scenarios available for download at http://select.morningstar.com.

Discounted Cash Flow Valuation

	USD Mil	Firm Value (%)	Per Share Value
Present Value Stage I	30,638	35.1	142.26
Present Value Stage II	22,682	26.0	105.32
Present Value Stage III	34,068	39.0	158.19
Total Firm Value	**87,388**	**100.0**	**405.77**
Cash and Equivalents	6,200	—	28.79
Debt	-6,553	—	-30.43
Preferred Stock	—	—	—
Other Adjustments	-1,032	—	-4.79
Equity Value	**86,002**	**—**	**399.33**
Projected Diluted Shares	215		
Fair Value per Share (USD)	—		

The data in the table above represent base-case forecasts in the company's reporting currency as of the beginning of the current year. Our fair value estimate may differ from the equity value per share shown above due to our time value of money adjustment and in cases where probability-weighted scenario analysis is performed.

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Morningstar Analyst Forecasts

Income Statement (USD Mil)

Fiscal Year Ends in December	2013	2014	2015	*Forecast* 2016	*Forecast* 2017
Revenue	**6,932**	**9,704**	**10,765**	***11,233***	***11,745***
Cost of Goods Sold	858	1,171	1,240	*1,292*	*1,321*
Gross Profit	**6,074**	**8,533**	**9,525**	***9,941***	***10,424***
Selling, General & Administrative Expenses	1,712	2,232	2,113	*2,022*	*2,114*
Research & Development	1,444	1,893	2,013	*2,190*	*2,290*
Other Operating Expense (Income)	85	—	—	—	—
Depreciation & Amortization (if reported separately)	343	490	383	*350*	*327*
Operating Income (ex charges)	**2,491**	**3,917**	**5,016**	***5,379***	***5,692***
Restructuring & Other Cash Charges	-26	-56	124	—	—
Impairment Charges (if reported separately)	—	—	—	—	—
Other Non-Cash (Income)/Charges	—	—	—	—	—
Operating Income (incl charges)	**2,516**	**3,973**	**4,892**	***5,379***	***5,692***
Interest Expense	36	—	—	*279*	*279*
Interest Income	1	-26	-124	—	—
Pre-Tax Income	**2,481**	**3,947**	**4,768**	***5,099***	***5,413***
Income Tax Expense	601	990	1,162	*1,318*	*1,395*
Other After-Tax Cash Gains (Losses)	—	-15	-13	—	—
Other After-Tax Non-Cash Gains (Losses)	—	—	—	—	—
(Minority Interest)	-17	-7	-46	*-28*	*-28*
(Preferred Dividends)	—	—	—	—	—
Net Income	**1,863**	**2,935**	**3,548**	***3,754***	***3,991***
Weighted Average Diluted Shares Outstanding	238	237	231	*219*	*213*
Diluted Earnings Per Share	**7.82**	**12.38**	**15.35**	***17.14***	***18.73***
Adjusted Net Income	2,137	3,282	3,936	*4,087*	*4,306*
Diluted Earnings Per Share (Adjusted)	**8.97**	**13.84**	**17.02**	***18.66***	***20.21***
Dividends Per Common Share	—	—	—	—	—
EBITDA	**3,048**	**4,661**	**5,580**	***5,927***	***6,217***
Adjusted EBITDA	**3,022**	**4,605**	**5,704**	***5,927***	***6,217***

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273.27 USD	400.00 USD	280.00 USD	540.00 USD	Medium	Wide	Stable	Standard	Biotechnology

Morningstar Analyst Forecasts

Balance Sheet (USD Mil)

Fiscal Year Ends in December	2013	2014	2015	Forecast 2016	Forecast 2017
Cash and Equivalents	1,849	3,316	6,200	*7,431*	*7,711*
Investments	—	—	—	—	—
Accounts Receivable	824	1,575	1,227	*1,280*	*1,339*
Inventory	659	804	893	*930*	*951*
Deferred Tax Assets (Current)	—	—	—	—	—
Other Short Term Assets	479	447	1,151	*1,151*	*1,151*
Current Assets	**3,811**	**6,142**	**9,471**	***10,792***	***11,152***
Net Property Plant, and Equipment	1,751	1,766	2,188	*2,790*	*3,402*
Goodwill	1,233	1,760	2,664	*3,864*	*5,064*
Other Intangibles	4,475	4,029	4,085	*3,735*	*3,408*
Deferred Tax Assets (Long-Term)	—	—	—	—	—
Other Long-Term Operating Assets	594	619	1,108	*1,108*	*1,108*
Long-Term Non-Operating Assets	—	—	—	—	—
Total Assets	**11,863**	**14,316**	**19,516**	***22,289***	***24,134***
Accounts Payable	220	229	300	*312*	*320*
Short-Term Debt	3	3	3	—	*550*
Deferred Tax Liabilities (Current)	—	168	300	*300*	*300*
Other Short-Term Liabilities	1,535	1,819	2,000	*2,000*	*2,000*
Current Liabilities	**1,758**	**2,219**	**2,603**	***2,612***	***3,170***
Long-Term Debt	592	582	6,550	*6,550*	*6,000*
Deferred Tax Liabilities (Long-Term)	233	51	51	*51*	*51*
Other Long-Term Operating Liabilities	659	650	1,030	*1,030*	*1,030*
Long-Term Non-Operating Liabilities	—	—	—	—	—
Total Liabilities	**3,242**	**3,502**	**10,234**	***10,243***	***10,251***
Preferred Stock	—	—	—	—	—
Common Stock	—	—	—	—	—
Additional Paid-in Capital	4,024	4,196	4,196	*4,196*	*4,196*
Retained Earnings (Deficit)	6,349	9,284	12,750	*16,504*	*20,495*
(Treasury Stock)	-1,725	-2,612	-7,600	*-8,600*	*-10,753*
Other Equity	-28	-59	-59	*-59*	*-59*
Shareholder's Equity	**8,620**	**10,809**	**9,287**	***12,041***	***13,879***
Minority Interest	1	5	5	*5*	*5*
Total Equity	**8,621**	**10,814**	**9,292**	***12,046***	***13,884***

Biogen Inc BIIB (NAS) | ★★★★★

Last Price	Fair Value	Consider Buy	Consider Sell	Uncertainty	Economic Moat™	Moat Trend™	Stewardship	Industry Group
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Morningstar Analyst Forecasts

Cash Flow (USD Mil)

Fiscal Year Ends in December	2013	2014	2015	Forecast 2016	Forecast 2017
Net Income	1,863	2,942	2,942	*3,782*	*4,018*
Depreciation	188	198	198	*198*	*198*
Amortization	344	490	490	*350*	*327*
Stock-Based Compensation	136	155	155	*148*	*155*
Impairment of Goodwill	—	—	—	—	—
Impairment of Other Intangibles	—	—	—	—	—
Deferred Taxes	-245	-308	—	—	—
Other Non-Cash Adjustments	-28	-50	—	—	—
(Increase) Decrease in Accounts Receivable	-127	-512	—	*-53*	*-58*
(Increase) Decrease in Inventory	-244	-186	—	*-37*	*-21*
Change in Other Short-Term Assets	-160	-95	—	—	—
Increase (Decrease) in Accounts Payable	284	244	—	*12*	*7*
Change in Other Short-Term Liabilities	334	64	—	—	—
Cash From Operations	**2,346**	**2,942**	**3,785**	***4,400***	***4,626***
(Capital Expenditures)	-246	-288	-288	*-800*	*-810*
Net (Acquisitions), Asset Sales, and Disposals	-3,278	-375	-900	*-1,200*	*-1,200*
Net Sales (Purchases) of Investments	7	-16	-16	—	—
Other Investing Cash Flows	1,912	-864	—	—	—
Cash From Investing	**-1,605**	**-1,543**	**-1,204**	***-2,000***	***-2,010***
Common Stock Issuance (or Repurchase)	-334	-832	-4,000	*-1,000*	*-2,153*
Common Stock (Dividends)	—	—	—	—	—
Short-Term Debt Issuance (or Retirement)	—	—	—	*-3*	*550*
Long-Term Debt Issuance (or Retirement)	-452	-3	-3	—	*-550*
Other Financing Cash Flows	69	78	78	*-176*	*-183*
Cash From Financing	**-717**	**-757**	**-3,925**	***-1,179***	***-2,336***
Exchange Rates, Discontinued Ops, etc. (net)	8	-41	-41	—	—
Net Change in Cash	**33**	**601**	**-1,385**	***1,221***	***280***

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Comparable Company Analysis

These companies are chosen by the analyst and the data are shown by nearest calendar year in descending market capitalization order.

Valuation Analysis

		Price/Earnings			EV/EBITDA			Price/Free Cash Flow			Price/Book			Price/Sales		
Company/Ticker	Price/Fair Value	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)
Roche Holding AG ROG CHE	0.82	20.5	17.2	15.5	12.2	11.2	10.3	19.5	20.1	17.6	10.9	8.1	6.5	4.8	4.2	3.9
Novartis AG NOVN CHE	0.81	17.6	15.8	15.0	15.0	12.5	12.1	21.6	14.7	15.4	2.7	2.3	2.4	4.1	3.6	3.5
Sanofi SA SAN FRA	0.75	13.1	12.7	12.2	9.5	9.3	8.9	21.4	16.1	15.1	1.7	1.7	1.6	2.5	2.5	2.4
Teva Pharmaceutical Industries Ltd	0.86	11.0	10.0	9.5	9.7	6.4	6.2	23.2	9.2	7.9	1.4	1.3	1.3	2.6	1.9	2.0
Average		15.6	13.9	13.1	11.6	9.9	9.4	21.4	15.0	14.0	4.2	3.4	3.0	3.5	3.1	3.0
Biogen Inc BIIB US	**0.68**	**18.0**	***14.6***	***13.5***	**13.7**	***10.6***	***10.1***	**22.8**	***16.6***	***15.7***	**8.6**	***5.0***	***4.3***	**7.4**	***5.3***	***5.1***

Returns Analysis

		ROIC %			Adjusted ROIC %			Return on Equity %			Return on Assets %			Dividend Yield %		
Company/Ticker	Last Historical Year Total Assets (Mil)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)
Roche Holding AG ROG CHE	75,763 CHF	17.8	17.7	18.5	15.8	15.7	16.5	57.3	53.2	47.1	15.4	16.4	17.3	3.0	3.2	3.6
Novartis AG NOVN CHE	131,556 USD	15.6	15.4	17.3	10.9	10.8	12.0	24.1	10.5	11.7	13.8	6.1	6.8	3.2	3.8	3.9
Sanofi SA SAN FRA	— EUR	9.9	10.1	11.3	20.8	20.9	23.3	8.6	9.5	10.3	5.1	5.7	6.4	3.9	3.9	4.1
Teva Pharmaceutical Industries Ltd	— USD	24.7	23.3	16.9	13.2	12.8	9.4	6.7	8.6	10.5	3.8	4.3	4.5	2.3	2.9	3.0
Average		17.0	16.6	16.0	15.2	15.1	15.3	24.2	20.5	19.9	9.5	8.1	8.8	3.1	3.5	3.7
Biogen Inc BIIB US	**19,516** USD	**30.7**	***29.3***	***28.3***	**26.8**	***24.5***	***22.7***	**35.3**	***35.2***	***30.8***	**21.0**	***18.0***	***17.2***	—	—	—

Growth Analysis

		Revenue Growth %			EBIT Growth %			EPS Growth %			Free Cash Flow Growth %			Dividend/Share Growth %		
Company/Ticker	Last Historical Year Revenue (Mil)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)	2015	2016(E)	2017(E)
Roche Holding AG ROG CHE	48,145 CHF	1.4	6.1	7.3	-0.5	5.1	8.9	-5.6	9.1	10.8	160.6	-2.4	12.6	2.5	1.4	10.8
Novartis AG NOVN CHE	50,387 USD	-15.0	-3.1	3.2	-27.0	14.9	6.2	-4.4	-4.3	5.2	2.2	-6.0	-4.1	-1.2	1.0	5.2
Sanofi SA SAN FRA	37,582 EUR	10.2	0.2	3.8	9.2	9.2	10.5	6.3	2.6	4.5	7.0	37.1	4.2	1.1	2.6	4.5
Teva Pharmaceutical Industries Ltd	19,579 USD	-3.4	34.2	-3.6	13.7	28.2	5.2	7.4	9.9	5.8	-105.8	NM	-121.2	0.3	5.0	5.0
Average		-1.7	9.4	2.7	-1.2	14.4	7.7	0.9	4.3	6.6	16.0	9.6	-27.1	0.7	2.5	6.4
Biogen Inc BIIB US	**10,765** USD	**10.9**	***4.4***	***4.6***	**28.1**	***7.2***	***5.8***	**23.0**	***9.6***	***8.3***	**146.9**	***-22.6***	***8.6***	—	—	—

Biogen Inc BIIB (NAS) | ★★★★★

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Comparable Company Analysis

These companies are chosen by the analyst and the data are shown by nearest calendar year in descending market capitalization order.

Profitability Analysis

Company/Ticker	Last Historical Year Net Income (Mil)	Gross Margin %			EBITDA Margin %			Operating Margin %			Net Margin %			Free Cash Flow Margin %		
		2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*
Roche Holding AG ROG CHE	11,626 CHF	73.6	*73.4*	*74.0*	40.5	*40.1*	*40.6*	36.4	*36.1*	*36.6*	24.2	*24.8*	*25.7*	24.5	*21.1*	*22.4*
Novartis AG NOVN CHE	12,041 USD	65.5	*72.6*	*72.7*	29.4	*31.7*	*31.9*	18.3	*21.7*	*22.4*	23.9	*23.3*	*23.5*	18.9	*24.4*	*22.7*
Sanofi SA SAN FRA	7,224 EUR	69.0	*68.9*	*69.7*	29.3	*29.8*	*30.0*	19.9	*21.7*	*23.1*	19.2	*19.6*	*19.7*	11.8	*15.7*	*16.0*
Teva Pharmaceutical Industries Ltd	4,637 USD	56.8	*53.4*	*53.9*	32.7	*36.9*	*39.2*	26.1	*24.9*	*27.2*	23.7	*24.0*	*25.9*	11.3	*21.2*	*25.4*
Average		66.2	*67.1*	*67.6*	33.0	*34.6*	*35.4*	25.2	*26.1*	*27.3*	22.8	*22.9*	*23.7*	16.6	*20.6*	*21.6*
Biogen Inc BIIB US	**3,936** USD	**88.5**	***88.5***	***88.8***	**53.0**	***52.8***	***52.9***	**46.6**	***47.9***	***48.5***	**36.6**	***36.4***	***36.7***	**32.5**	***32.1***	***32.5***

Leverage Analysis

Company/Ticker	Last Historical Year Total Debt (Mil)	Debt/Equity %			Debt/Total Cap %			EBITDA/Interest Exp.			Total Debt/EBITDA			Assets/Equity		
		2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*
Roche Holding AG ROG CHE	23,251 CHF	110.8	*76.6*	*53.8*	52.6	*43.4*	*35.0*	22.5	*29.8*	*36.7*	1.2	*1.0*	*0.8*	3.6	*3.0*	*2.5*
Novartis AG NOVN CHE	21,931 USD	28.5	*32.5*	*30.3*	22.2	*24.5*	*23.2*	22.6	*21.7*	*22.1*	1.5	*1.6*	*1.4*	1.7	*1.7*	*1.7*
Sanofi SA SAN FRA	12,788 EUR	22.7	*21.0*	*19.1*	18.5	*17.4*	*16.1*	20.0	*21.6*	*24.0*	1.2	*1.1*	*1.0*	1.7	*1.6*	*1.6*
Teva Pharmaceutical Industries Ltd	12,518 USD	33.2	*100.0*	*99.7*	24.9	*50.0*	*49.9*	21.5	*6.1*	*6.3*	2.0	*4.1*	*4.0*	1.6	*2.3*	*2.3*
Average		48.8	*57.5*	*50.7*	29.6	*33.8*	*31.1*	21.7	*19.8*	*22.3*	1.5	*2.0*	*1.8*	2.2	*2.2*	*2.0*
Biogen Inc BIIB US	**6,553** USD	**70.6**	***54.4***	***47.2***	**41.4**	***35.2***	***32.1***	**—**	***21.2***	***22.2***	**1.1**	***1.1***	***1.1***	**2.1**	***1.9***	***1.7***

Liquidity Analysis

Company/Ticker	Market Cap (Mil)	Cash per Share			Current Ratio			Quick Ratio			Cash/Short-Term Debt			Payout Ratio %		
		2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*	2015	*2016(E)*	*2017(E)*
Roche Holding AG ROG CHE	215,987 CHF	10.64	*11.50*	*13.40*	1.19	*1.46*	*1.66*	0.86	*1.06*	*1.22*	1.49	*3.72*	*6.75*	59.2	*55.0*	*55.0*
Novartis AG NOVN CHE	176,855 CHF	2.23	*4.01*	*4.18*	0.96	*1.05*	*1.07*	0.70	*0.87*	*0.88*	0.97	*1.38*	*1.42*	37.4	*83.3*	*78.8*
Sanofi SA SAN FRA	94,905 EUR	3.87	*4.52*	*5.56*	1.77	*1.83*	*1.97*	1.22	*1.28*	*1.41*	3.28	*3.81*	*4.69*	75.7	*69.6*	*65.2*
Teva Pharmaceutical Industries Ltd	51,035 USD	18.45	*3.73*	*6.04*	2.74	*1.77*	*1.93*	2.36	*1.29*	*1.48*	16.07	*6.91*	*8.04*	56.2	*45.2*	*37.3*
Average		8.80	*5.94*	*7.30*	1.67	*1.53*	*1.66*	1.29	*1.13*	*1.25*	5.45	*3.96*	*5.23*	57.1	*63.3*	*59.1*
Biogen Inc BIIB US	**59,757** USD	**26.82**	***33.93***	***36.20***	**3.64**	***4.13***	***3.52***	**3.29**	***3.78***	***3.22***	**1,774.47**	**—**	***14.02***	**—**	**—**	**—**

Research Methodology for Valuing Companies

Components of Our Methodology

- Economic Moat™ Rating
- Moat Trend™ Rating
- Moat Valuation
- Three-Stage Discounted Cash Flow
- Weighted Average Cost of Capital
- Fair Value Estimate
- Scenario Analysis
- Uncertainty Ratings
- Margin of Safety
- Consider Buying/Selling
- Stewardship Rating

We believe that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate, in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth. Four key components drive the Morningstar rating: our assessment of the firm's economic moat, our estimate of the stock's fair value, our uncertainty around that fair value estimate and the current market price. This process ultimately culminates in our single-point star rating. Underlying this rating is a fundamentally focused methodology and a robust, standardized set of procedures and core valuation tools used by Morningstar's equity analysts.

The concept of the Morningstar Economic Moat™ Rating plays a vital role not only in our qualitative assessment of a firm's investment potential, but also in our actual calculation of our fair value estimates. We assign three moat ratings—none, narrow, or wide—as well as the Morningstar Moat Trend™ Rating—positive, stable, or negative—to each company we cover. Companies with a narrow moat are those we believe are more likely than not to achieve normalized excess returns on invested capital over at least the next 10 years. Wide-moat companies are those in which we have very high confidence that excess returns will remain for 10 years, with excess returns more likely than not to remain for at least 20 years. The longer a firm generates economic profits, the higher its intrinsic value. The assumptions that we make about a firm's economic moat play a vital role in determining the length of "economic outperformance" that we assume in the terminal sections of our valuation model. To assess the sustainability of excess profits, analysts perform ongoing assessments of what we call the moat trend. A firm's moat trend is positive in cases where we think its sources of competitive advantage are growing stronger; stable where we don't anticipate changes to competitive advantages over the next several years; or negative when we see signs of deterioration.

At the heart of our valuation system is a detailed projection of a company's future cash flows. The first stage of our three-stage discounted cash flow model can last from 5 to 10 years and contains numerous detailed assumptions about various financial and operating items. The second stage of our model—where a firm's return on new invested capital (RONIC) and earnings growth rate implicitly fade until the perpetuity year—can last anywhere from one year (for companies with no economic moat) to 10-15 years (for wide-moat companies). In our third stage, we assume the firm's RONIC equals its weighted average cost of capital, and we calculate a continuing value using a standard perpetuity formula. In deciding on the rate at which to discount future cash flows, we use a building block approach,

Morningstar Research Methodology for Valuing Companies

Source: Morningstar, Inc.

Detailed Methodology Documents and Materials*

- Comprehensive Equity Research Methodology
- Uncertainty Methodology
- Cost of Equity Methodology
- Morningstar DCF Valuation Model
- Stewardship Rating Methodology

*Please contact a sales representative for more information.

which takes into account expectations for market real return, inflation, country risk premia, corporate credit spread, and any additional systematic risk.

We also employ a number of other tools to augment our valuation process, including scenario analysis, where we assess the likelihood and performance of a business under different economic and firm-specific conditions. Our analysts model three scenarios for each company we cover, stress-testing the model and examining the distribution of resulting fair values.

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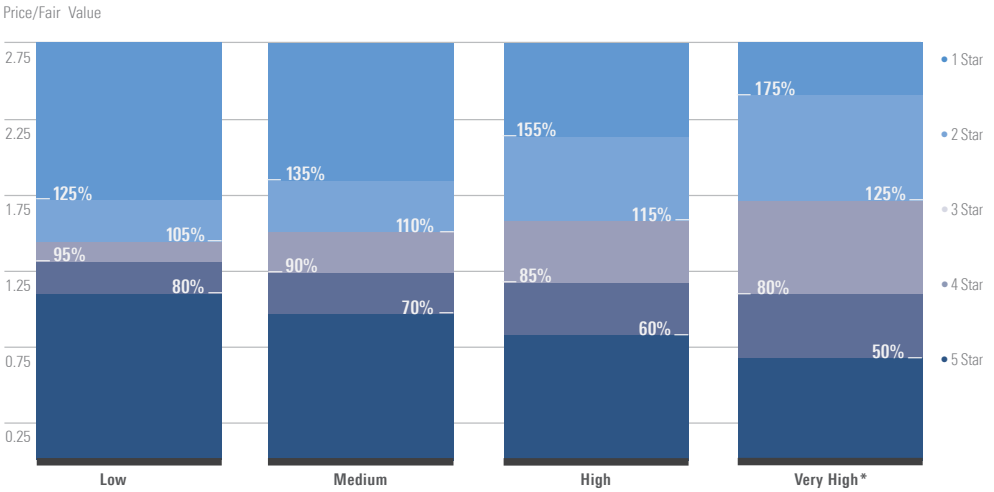
Our corporate Stewardship Rating represents our assessment of management's stewardship of shareholder capital, with particular emphasis on capital allocation decisions. Analysts consider companies' investment strategy and valuation, financial leverage, dividend and share buyback policies, execution, compensation, related party transactions, and accounting practices. Corporate governance practices are only considered if they've had a demonstrated impact on shareholder value. Analysts assign one of three ratings: "Exemplary," "Standard," and "Poor." Analysts judge stewardship from an equity holder's perspective. Ratings are determined on an absolute basis. Most companies will receive a Standard rating, and this is the default rating in the absence of evidence that managers have made exceptionally strong or poor capital allocation decisions.

Morningstar Margin of Safety and Star Rating Bands

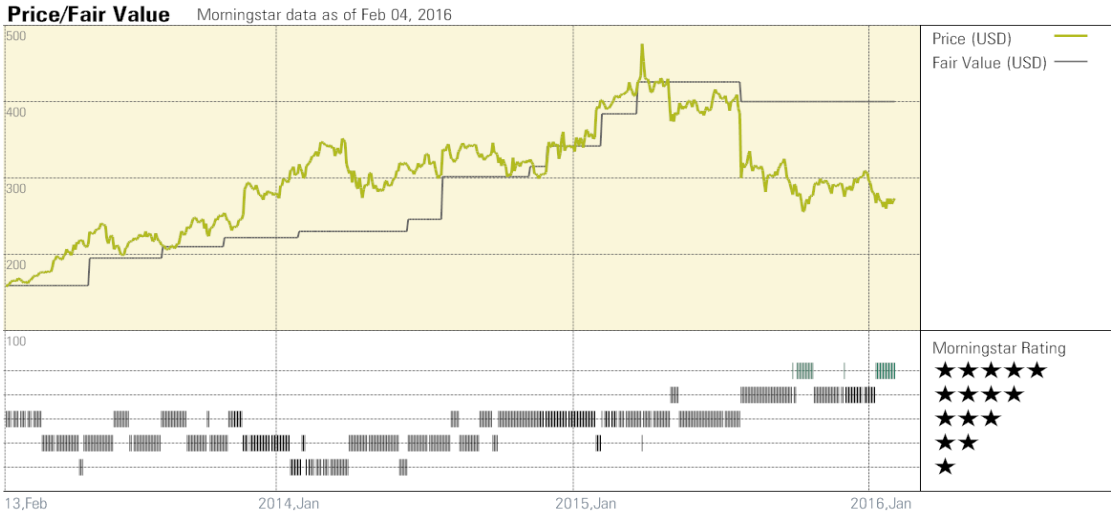


* Occasionally a stock's uncertainty will be too high for us to estimate, in which case we label it Extreme.

Source: Morningstar, Inc.

Biogen Inc BIIB (NAS) | ★★★★★

Last Price	Fair Value	Consider Buy	Consider Sell	Uncertainty	Economic Moat™	Moat Trend™	Stewardship	Industry Group
273.27 USD	400.00 USD	280.00 USD	540.00 USD	Medium	Wide	Stable	Standard	Biotechnology



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Biogen Inc BIIB (NAS) | ★★★★★

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